

**WHAT IS CLAIMED IS:**

1        1. A method of ensuring a requested Quality of  
2        Service (QoS) for a media flow that is routed from a  
3        first terminal in an originating network, through at  
4        least one transit network, to a second terminal in a  
5        terminating network, said originating network including  
6        an Originating Bandwidth Broker (BB-O) and an Originating  
7        Media Policy Server (MPS-O), said transit network  
8        including a Transit Bandwidth Broker (BB-T) and a Transit  
9        Media Policy Server (MPS-T), and said terminating network  
10      including a Serving Bandwidth Broker (BB-S) and a Serving  
11      Media Policy Server (MPS-S), said method comprising the  
12      steps of:

13            sending an origination message from the originating  
14        network to the terminating network with a proposed  
15        session description that identifies the requested QoS;

16            determining by the terminating network that the  
17        session description is agreeable;

18            sending a first Bandwidth Broker Protocol Resource  
19        Allocation Request (RAR) from the BB-S to the BB-T with  
20        binding information that identifies the first and second  
21        terminals and the requested QoS;

22            determining by the BB-T whether a Service Level  
23        Agreement (SLA) between the transit network and the

24 terminating network allows sufficient resources to be  
25 allocated to meet the requested QoS;

26 sending a second RAR from the BB-T to the BB-O with  
27 the binding information, upon determining by the BB-T  
28 that the SLA between the transit network and the  
29 terminating network allows sufficient resources to be  
30 allocated to meet the requested QoS;

31 reserving the resources required to meet the  
32 requested QoS in the originating network, the transit  
33 network, and the terminating network; and

34 setting up a multimedia session to carry the media  
35 flow with the requested QoS.

1       2. The method of ensuring a requested QoS for a  
2 media flow of claim 1 further comprising, after the step  
3 of sending a second RAR from the BB-T to the BB-O with  
4 the binding information, the steps of:

5       sending a first Resource Allocation Answer (RAA)  
6 from the BB-O to the BB-T;

7       sending a second RAA from the BB-T to the BB-S; and  
8       installing by the BB-O, the BB-T, and the BB-S,  
9 applicable policies in edge routers to provide the  
10 requested QoS in the originating network, the transit  
11 network, and the terminating network, respectively.

1           3. The method of ensuring a requested QoS for a  
2 media flow of claim 2 further comprising, before the step  
3 of reserving the resources required to meet the requested  
4 QoS, the steps of:

5           sending a QoS reservation request that includes the  
6 agreed session description and the binding information  
7 from an Originating Call State Control Function  
8 (Originating P-CSCF) to the BB-O;

9           determining by the BB-O whether a previous valid  
10 resource reservation exists for the session associated  
11 with the binding information; and

12           sending an immediate successful reservation response  
13 from the BB-O to the Originating P-CSCF, upon determining  
14 that a previous valid resource reservation exists for the  
15 session associated with the binding information.

1           4. The method of ensuring a requested QoS for a  
2 media flow of claim 3 further comprising the steps of:

3           reserving resources required for the requested QoS,  
4 upon determining that a previous valid resource  
5 reservation does not exist for the session associated  
6 with the binding information.

1       5. The method of ensuring a requested QoS for a  
2 media flow of claim 4 wherein the step of determining by  
3 the BB-O whether a previous valid resource reservation  
4 exists includes the steps of:

5           determining whether a previous resource reservation  
6 was made for the session associated with the binding  
7 information; and

8           upon determining that a previous resource  
9 reservation was made, determining from a time stamp  
10 associated with the previous reservation whether the  
11 previous reservation is still valid.

1       6. The method of ensuring a requested QoS for a  
2 media flow of claim 3 wherein the step of sending the QoS  
3 reservation request from the Originating P-CSCF to the  
4 BB-O includes sending the QoS reservation request  
5 utilizing a Common Open Policy Service (COPS) protocol  
6 and a Bandwidth Broker protocol.

1       7. The method of ensuring a requested QoS for a  
2 media flow of claim 1 further comprising the step of  
3 creating the binding information from a source Internet  
4 Protocol (IP) address of the first terminal, an  
5 identification of a Real Time Protocol (RTP) port  
6 assigned by the first terminal, a destination IP address

7       of the second terminal, and an identification of an RTP  
8       port assigned by the second terminal.

1           8. A Multimedia Control Server (MMCS) in a multi-  
2       service core network for ensuring a requested Quality of  
3       Service (QoS) for a media flow being routed from a first  
4       terminal in the core network to a second terminal in a  
5       terminating network, said MMCS comprising:

6           an Originating Call State Control Function  
7       (Originating P-CSCF) that serves the first terminal;

8           an Originating Bandwidth Broker (BB-O) that manages  
9       resources in the originating network;

10          a first interface between the Originating P-CSCF and  
11       the BB-O for passing binding information from the  
12       Originating P-CSCF to the BB-O, the binding information  
13       identifying the first and second terminals and the  
14       requested QoS;

15          an Originating Media Policy Server (MPS-O) that  
16       provides policy rules regarding allocation of resources  
17       in the originating network;

18          a second interface between the MPS-O and the BB-O  
19       for passing the policy rules from the MPS-O to the BB-O;  
20       and

21          a third interface between the BB-O and a plurality  
22       of edge routers that route the media flow into and out of  
23       the originating network, said third interface for passing

24 from the BB-O to the edge routers, policy rules  
25 applicable to a specific media flow.

26 9. A Multimedia Control Server (MMCS) in a multi-  
27 service core network for ensuring a requested Quality of  
28 Service (QoS) for a media flow from an application on a  
29 first terminal that is transported through a network  
30 owned by an administration, said media flow being routed  
31 through at least one transit network that is not owned by  
32 the same administration, to a second terminal in a  
33 terminating network, said MMCS comprising:  
34       an Originating Call State Control Function  
35 (Originating P-CSCF) that serves the first terminal;

36       an Originating Bandwidth Broker (BB-O) that manages  
37 resources in the originating network;

38       a first interface between the Originating P-CSCF and  
39 the BB-O for passing a session description and binding  
40 information from the Originating P-CSCF to the BB-O, the  
41 binding information identifying the first and second  
42 terminals and the requested QoS;

43       an Originating Media Policy Server (MPS-O) that  
44 provides policy rules regarding allocation of resources  
45 in the originating network;

46       a second interface between the MPS-O and the BB-O  
47 for passing the policy rules from the MPS-O to the BB-O;

48           a third interface between the BB-O and a plurality  
49       of edge routers that route the media flow into and out of  
50       the originating network, said third interface for passing  
51       from the BB-O to the edge routers, policy rules  
52       applicable to a specific media flow; and

53           a fourth interface between the BB-O and a Transit  
54       Bandwidth Broker (BB-T) in the transit network for  
55       passing the binding information from the BB-T to the BB-  
56       O, said binding information having been received by the  
57       BB-T from a Serving Bandwidth Broker (BB-S) in the  
58       terminating network.

1           10. The MMCS of claim 9 further comprising a fifth  
2       interface between the MPS-O and a clearing house that  
3       performs as an Authorization, Authentication, and  
4       Accounting (AAA) server.

1           11. A system for ensuring a requested Quality of  
2       Service (QoS) for a media flow belonging to an  
3       application and originating in an originating network  
4       owned by an administration, said media flow being routed  
5       from a first terminal in the originating network through  
6       at least one transit network that is not owned by the  
7       same administration, to a second terminal in a  
8       terminating network, said system comprising:

9           a first Multimedia Control Server (MMCS) in the  
10          originating network comprising:

11            an Originating Call State Control Function  
12          (Originating P-CSCF) that serves the first terminal;

13            an Originating Bandwidth Broker (BB-O) that  
14          manages resources in the originating network;

15            a first interface between the Originating P-  
16          CSCF and the BB-O for passing a session description and  
17          binding information from the Originating P-CSCF to the  
18          BB-O, the binding information identifying the first and  
19          second terminals and the requested QoS;

20            an Originating Media Policy Server (MPS-O) that  
21          provides policy rules regarding allocation of resources  
22          in the originating network;

23            a second interface between the MPS-O and the  
24          BB-O for passing the policy rules to the BB-O;

25            a plurality of originating edge routers that route  
26          the media flow into and out of the originating network;

27            a third interface between the originating edge  
28          routers and the BB-O for passing policy rules applicable  
29          to specific media flows from the BB-O to the originating  
30          edge routers;

31            a second MMCS in the terminating network comprising:

32            a Serving Call State Control Function  
33          (Terminating P-CSCF) that serves the second terminal;

34                 a Serving Bandwidth Broker (BB-S) that manages  
35                 resources in the terminating network;  
36                 a fourth interface between the Terminating P-  
37                 CSCF and the BB-S for passing an agreed session  
38                 description from the Terminating P-CSCF to the BB-S;  
39                 a Serving Media Policy Server (MPS-S) that  
40                 provides policy rules regarding allocation of resources  
41                 in the terminating network;  
42                 a fifth interface between the MPS-S and the BB-  
43                 S for passing the policy rules from the MPS-S to the BB-  
44                 S;  
45                 a plurality of serving edge routers that route the  
46                 media flow into and out of the terminating network;  
47                 a sixth interface between the serving edge routers  
48                 and the BB-S for passing policy rules applicable to  
49                 specific media flows from the BB-S to the serving edge  
50                 routers;  
51                 a Transit Bandwidth Broker (BB-T) in the transit  
52                 network;  
53                 a seventh interface between the BB-S and the BB-T  
54                 for passing the binding information from the BB-S to the  
55                 BB-T in a first Resource Allocation Request (RAR); and  
56                 an eighth interface between the BB-T and the BB-O  
57                 for passing the binding information from the BB-T to the  
58                 BB-O in a second RAR.